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ABSTRACT

This training guide has been developed for use by staff members of the U.S. Marine Corps, Office of Manpower Utilization in their preparation for Task Analysis projects, the first step in a research program aimed at increasing the effectiveness of the Marine Corps' manpower management program. The guide is designed to provide basic orientation to Task Analysis and detailed suggestions for carrying out the entire observation and interview phase of the Task Analysis process. The background of experience in job analysis is described in terms of the most common methods and their advantages and limitations. Special attention is directed to requirements of reliability and validity and to recommended procedures for meeting these requirements. To ensure the quality of findings in Task Analysis studies of Marine Corps Occupational Fields, specific recommendations are given for all major steps in the data-gathering process including improving interviews by checking questions, building respondent motivation, developing listening ability, managing the interview, and improving both observation and the recording of information. (Author/WL)

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TRAINING GUIDE FOR OBSERVATION AND INTERVIEWING IN MARINE CORPS TASK ANALYSIS

Training Manual III

Arthur H. Kuriloff, Dale Yoder, and C. Harold Stone

Technical Report No. 2

EVALUATION OF THE MARINE CORPS
TASK ANALYSIS PROGRAM

A Research Project Supported By

Commandant of the Marine Corps (Code RD)

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This Training Guide has been developed for use by staff members of the Office of Manpower Utilization (OMU), HQ, USMC in their preparation for Task Analysis projects. It is designed to provide basic orientation to Task Analysis and detailed suggestions for carrying out the entire observation and interview phase of the Task Analysis process. The background of experience in job analysis is described in terms of the most common methods and their advantages and limitations. Special attention is directed to requirements of

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SUMMARY

This Training Guide has been developed for use by staff members of the Office of Manpower Utilization (OMU), HQ, USMC in their preparation for Task Analysis projects. It is designed to provide a basic introduction to Task Analysis and other methods of job analysis, as well as detailed suggestions for carrying out the entire observation and interview phase of the Task Analysis process. The background of experience in job analysis is described in terms of the most common methods and their advantages and limitations. Special attention is directed to requirements of reliability and validity in Task Analysis studies and to recommended procedures for meeting these requirements. To ensure the quality of findings, this Training Guide details specific recommendations for all major steps in the data-gathering process including improving interviews by checking questions, building respondent motivation, developing listening ability, managing the interview, and improving both observation and the recording of information.

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PREFACE

PURPOSE OF THIS TRAINING GUIDE

Few, if any, of the new staff members of the Office of Manpower Utilization HQ, USMC (OMU), have had any duty or experience directly related to their new responsibilities as members of Task Analysis Teams. To assist them in adapting to the new assignment, this Training Guide has been prepared to aid in their orientation and introduction to these new duties. It starts with the assumption that each Task Analysis program is in essence a research study or project. Staff members need to understand both the purpose and the process involved in these studies and the necessity for prescribed methods and special precautions to ensure the accuracy and dependability of results.

The first section of the Guide following the Introduction gives a brief background summary of the methods available for performing job analysis studies. Although the Marine Corps may find itself limited at this time to two or three of the ten methods listed, conditions in the future may suggest the desirability of adding or substituting other approaches. Interviewing is essential in almost all of these methods, and observation is important in several. Knowing what to do and how to do it in observing and interviewing is important for Task Analysis as it is now conducted and as it may be conducted in the future.

Because observation and interviewing are so widely useful in job analysis, Sections III through V of this Training Guide recommend specific training methods and procedures for improving the

Observation and Interview (O & I) phase of Task Analysis in the Marine Corps. Recommendations are made to the analyst for gaining personal skill in observing and interviewing and for improving the management of these procedures.

This is one of a series of five training manuals prepared to assist in the orientation and training of newly assigned personnel and to aid in maintaining and improving effectiveness of more experienced personnel. Training Manuals I and II cover principles of training in task analysis and orientation to task analysis. Training Manuals IV and V provide guidelines for communications and teamwork in task analysis projects. This third manual is being published in advance of Training Manuals I and II because it is the first of the series to be completed.

I

INTRODUCTION

TASK ANALYSIS IS RESEARCH

Task Analysis in the Marine Corps is the first step in a research program aimed at increasing the effectiveness of the Marine Corps' manpower management program. And the development of Task Inventories is essentially a preliminary research project in the overall research program.

This Training Guide draws on basic ideas from research in anthropology, behavioral science, psychology, and allied fields for the data it presents. Much of this research will be found to have many things in common with the research required by Task Analysis (TA) as being carried out in the Marine Corps. Members of the TA teams should therefore think of themselves as researchers and should perform in a research-oriented manner to ensure the reliability of their results.

Different terms are used in the Training Guide to express various aspects of the research approach. The member of the TA team may therefore be called researcher, analyst, observer, or interviewer.

Similarly, the Marine being observed at work, or being interviewed, may be referred to as job incumbent, subject, respondent, or interviewee, depending upon the situation being discussed.

WHY MARINE CORPS TASK ANALYSIS?

Task Analysis research is designed to suggest improved ways for classifying and assigning individual Marines, and for evaluating and improving training policies and procedures for them. The basic data upon which the whole research program rests comes from answers to these questions:

- What does the Marine really do?
- Why does he perform his job?
- How does he perform his job?
- What skill attributes and levels does he require to perform his job?

The quality and value of findings and results in TA studies are evaluated in terms of two characteristics--reliability and validity. Accordingly, the third section of this Training Guide explains and outlines methods of achieving acceptable levels of quality in terms of reliability and validity. This discussion leads directly to methods of improving skills in observation and interviewing with specific recommendations for developing effective questions, building motivation in interviewees, learning to listen, and recording both responses and observations.

The paragraphs that follow outline the major steps or phases in TA research.

Steps in the Task Analysis Program[1]

The Task Analysis (TA) program follows a seven-step procedure,

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1. Capts. Cummins, C.J. and Shahan, M.J., USMC, "Manpower Planning", MARINE CORPS GAZETTE, June 1974.

briefly described as follows:

1) The Study Phase. In starting a TA study, a team of analysts gathers all available pertinent information about an occupational field (OF). These data include: positions and billets, programs and outlines of instruction, technical manuals of all military services, and other published material related to the OF being studied. Military occupational field specialists, occupational field sponsors, monitors, and other HQMC agencies concerned with the OF under study are called upon for information, assistance, and general guidance as the study progresses. TA teams visit military and civilian schools to gain first hand knowledge about the materials being taught and the techniques being used to train Marines.

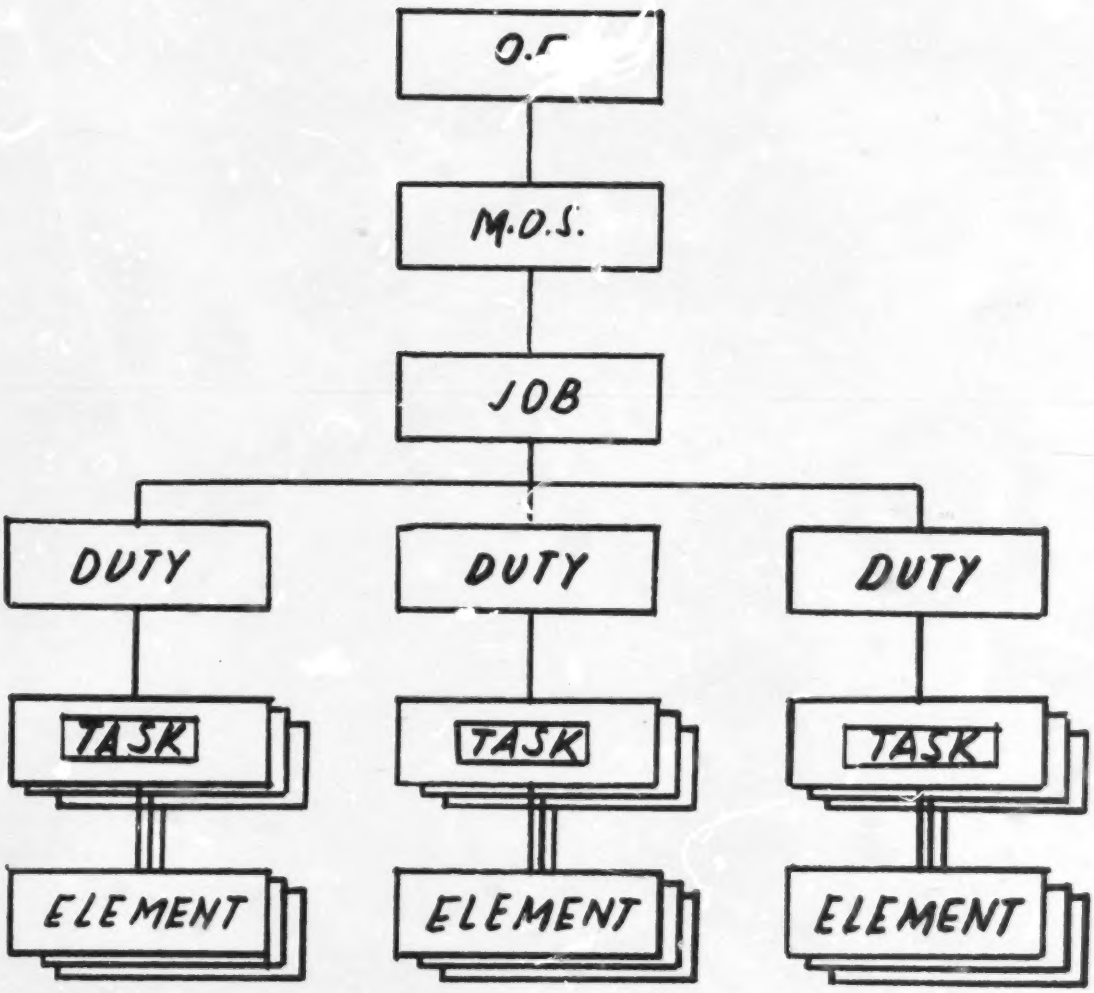
2) The Observation and Interview Phase. In the second step, analysts visit selected Marine Corps commands to observe and interview Marine job incumbents as they actually perform their work. All pay grades in each billet and Military Occupational Specialty (MOS) are interviewed and observed so that the OF is completely represented in the TA study.

This is a critical step in the TA process and this Training Guide is designed to help members of the TA team improve their observing and interviewing skills.

Data, the facts about the work thus disclosed, are classified in the categories of job components shown in Figure 1 on the next page.

3) Construction of the Task Inventory. The task analysts

Figure 1



Job Components--Duties, Tasks, and Elements[2]

2. For definitions, see page 37.

then build a task inventory from the information collected in both the study and the O & I phases. The inventory lists all the work tasks as accurately and completely as possible to describe the whole summary of work being performed in an OF. Also listed in the inventory are job titles, equipment, and tools used. The inventory is then reviewed for accuracy and completeness by MOS specialists, occupational field sponsors, monitors, instructors at related schools, and other informed contributors.

4) Inventory Administration Phase. The task analysts then visit major Marine commands to administer the task inventory in its final corrected form to individual Marines in the OF being studied. Each Marine records his responses in a special booklet designed to facilitate transfer of resulting, accumulated data to computer tape. Each completed booklet thus creates a unique job description, since it specifies the work activities of one Marine and shows how his time is distributed among the tasks listed. (It should be noted that task analysts are not inspectors; nor are they time-and-motion experts. The function of the task analyst is to secure factual information to improve the Marine Corps' manpower management program.)

5) The Processing Phase. The completed booklets are then analyzed by a computerized procedure that divides the data into various groups called "clusters." These clusters identify and distinguish the different jobs in the OF.

6) The Analysis Phase. The computer output and related and pertinent facts are then analyzed. The results of this

analysis are used to improve the functional areas of:

- Classification of Marines into various occupational fields and military occupation skills.
- Assignment of these Marines into various formal schools, on-the-job training, and to various billets.
- Training: Evaluation of the contributions and use of various schools and courses of instruction--including their modification, conception, creation and deletion.
- Grade and MOS Structure, which may be created, modified, and/or deleted as necessary.
- Jobs are Validated and individual jobs are defined using these new job descriptions.

Other areas that could conceivably be affected by these findings include force structure, tables of organization, equipment specifications, and logistic support requirements.

7) The Final Report. Upon completion of the analysis and internal HQMC staff action, a final TA report is prepared by the Director, Manpower Plans and Policies Division (Code MP), and is forwarded to the Chief of Staff, HQMC, for his decision. After approval by the Chief of Staff, the Manpower Control Branch (Code MPC) monitors the implementation of approved recommendations from the TA to ensure that effective action is taken. Directives and training guidance in keeping with the new or modified OF requirements are instituted by Headquarters. The job data are then made available upon request to functional area managers, field commands, and schools.

As indicated in the preface, attention is first directed in the following Sections to a description of current and traditional approaches to job analysis and their implications for the Marine Corps Task Analysis program.

II

JOB ANALYSIS METHODS

Job Analysis is a time-tested and widely used tool, designed and planned to discover specifically what is done in each individual job. There are many methods and procedures, varying in detail, complexity, and difficulty. Those charged with conducting job studies can choose the approach that best fits their purposes, needs and resources.

Following is a brief summary of some of the more acceptable ways of collecting data for job analysis as proved in practice.[3] These are listed in order of likely preference in view of the constraints of time and budget under which the Marine Corps Task Analysis Program is now operating. One of the first four, or a combination of them: Individual Interview Method, Technical Conference Method, Group Interview Method, and Observation Interview Method, would seem most practicable under these circumstances.

INDIVIDUAL INTERVIEW METHOD

Here "representative" job incumbents are selected for extensive interviewing--usually outside of the actual job situation. The interview is usually structured, and the results of a number of interviews are combined to complete a single job

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3. This is a synopsis of the discussion presented in Blum and Naytor, INDUSTRIAL PSYCHOLOGY: ITS THEORETICAL AND SOCIAL FOUNDATION, rev. ed., New York: Harper & Row, 1968.

analysis. The technique is obviously cumbersome, costly, and time-consuming, but a very complete picture of the job can be obtained.

TECHNICAL CONFERENCE METHOD

This method uses "experts" rather than actual job incumbents as a source of information. These experts are usually trainers and supervisors who have extensive knowledge of the job in question. They meet with job analysts and cooperate to specify all the characteristics of the job. The problem with this method is that the experts may not actually know as much about the job as the analysts expect and assume, since they do not actually perform the tasks of the job. Thus, their judgments are likely to be only estimates based upon their background of knowledge and experience.

GROUP INTERVIEW METHOD

The group interview is similar to the individual interview except that a number of job incumbents are interviewed simultaneously. Under the guidance of the interviewer, the interviewees recall and discuss their work activities. The interviewer then combines their comments into a single job description. One advantage over the individual method is a savings in time.

OBSERVATION INTERVIEW METHOD

The observation interview takes place on the job. The interviewer collects data from the incumbent, using normal interview

methods, as the incumbent performs the work. The interviewer observes and questions the worker in an attempt to get complete job description data. Like the individual interview, it is a slow and costly method, and may also interfere with normal work operations. Nevertheless, it generally produces a good and complete job description.

CHECK-LIST METHOD

This technique requires the worker to check the tasks needed to be performed that appear on a long list of possible task statements. In order to prepare the check list, however, extensive preliminary work is required to collect appropriate task statements. While check-lists are easy for the incumbent to respond to, and are easily administered to large groups and easy to tabulate, they may not provide an integrated picture of the job in question.

QUESTIONNAIRE METHOD

This method is ordinarily used to obtain information about occupations via a mail survey. The job incumbent is asked to provide written personal and job data. The method is good for people who write with facility but not so good for workers who have little ease in self-expression. Also, it is often a time-consuming and laborious process to analyze data obtained in this manner.

WORK PARTICIPATION METHOD

With this procedure the job analyst actually performs the work of the job. By doing the work the analyst is able to obtain first-hand information about the characteristics of the job. The technique is fairly effective for simple jobs, but complex jobs require that the analyst be extensively trained prior to actively participating in the work. The method is clearly time-consuming and costly.

CRITICAL INCIDENT METHOD

This method involves the collection of a series of statements about job behavior gathered from direct observation or memory, about good and poor job performance. This method may be used for assessing performance in evaluating job incumbents. Although the method can provide information about critical aspects of the job, it does not usually give an integrated picture of the entire set of tasks in a job.

DIARY METHOD

Here job incumbents are required to record their daily activities each day in a logbook or diary. The method is good in that it gathers a great deal of information systematically, but if the recording forms are not kept simple, it can take a great deal of time both for the recorder, and later for the analyst.

METHOD DEVELOPED BY THE AIR FORCE

The method developed by the Air Force combines the features

of the check-list with those of the questionnaire and the observation interview.[4] This procedure for developing a job analysis inventory is comprised of the following steps:

1. Development of a preliminary task inventory of from 200 to 300 task statements using job descriptions, training materials, experts, and all other possible sources.

2. Administration of preliminary inventory to experienced job incumbents for purposes of review and modification of task statements.

3. Administration of a revised inventory to large samples of job incumbents who are asked to respond to all statements and to add any that they feel have been omitted.

Inventories constructed in this manner have been found to possess average reliabilities of about 0.70, which means that they are consistent and dependable.

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4. Morsh, J.E., "Job Analysis in the United States Air Force", PERSONNEL PSYCHOLOGY, 1964, 17, pp. 7-17.

III

ACHIEVING RELIABILITY AND VALIDITY IN TASK ANALYSIS

In the MC Task Analysis program, seven steps or phases are included and have been described in the Introduction. This Training Guide is primarily concerned with Phase 2, Observation and Interview.

In the process of Observation and Interview special care must be taken to ensure accurate, undistorted observations.

The tendency for human beings to make errors in observation can be minimized by using the techniques of participant observation. The application of these techniques will help the analysts to make observations without appreciably distorting what they see. This requires the analysts to be aware of their own prejudices and the possible effect of these prejudices on the interpretations they make of what they see and hear. The ability to interpret what is observed without undue distortion is known as adequate subjectivity.

If, for example, the observer were a highly qualified expert in the job being analyzed, he might overlook tasks that to him were obvious, yet that might be important to the task analysis. Custom tends to induce blindness in that people who are thoroughly familiar with a job often overlook bits and pieces of procedures that have become routine to them. The observer is trapped

when this happens by the undesirable impact of his expertness on his observations. Here he would show a lack of adequate subjectivity.

But adequate subjectivity is not enough; it must be coupled with adequate objectivity. By definition, completely objective observers would have no advance knowledge about the job they were studying. Although their observations would not be biased, they could be inadequate. What is required to improve the results of observation is sufficient understanding about the job to give the observer enough background to make sound inferences about what he observes. At this level of knowledge the observer would show adequate objectivity.

Only two modes of gathering data are available in Observation and Interview procedures (O & I): 1) The analyst can watch what people do and hear what they say; or 2) The analyst can ask people about their own actions and the behavior of others.[5]

In this training guide the term observation (and observer) will be used to include both visual data gathering and that resulting from questioning respondents, because the same principles in general apply to both. Similarly, reference will be made to research and research methods inasmuch as development of task statements for TA Inventories is, as previously noted, essentially a research process.

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5. Kerlinger, Fred N., FOUNDATIONS OF BEHAVIORAL RESEARCH, New York: Holt, Rinehart and Winston, Inc., 1964, p. 504.

SUBJECTIVE AND OBJECTIVE PERSPECTIVES

The effectiveness of Task Analysis (TA) to the Marine Corps depends in the first place on the reliability and validity of the data collected for preparing the TA inventories. The analysts who gather data are subject to human limitations, as are the Marine respondents. The analysts, subject to human fallibility, can affect the reliability of the O & I simply by being part of the process. They can draw quite incorrect inferences from observations.

The method of participant observation, widely used in sociological research, has much to offer O & I procedures. It is clearly not practicable to adopt the total approach, which is inherently a lengthy and therefore costly process for the purpose of TA. But there are so many important and useful aspects to the methodology of participant observation that they can serve as desirable inputs to the three methods of data gathering recommended for O & I.

The researcher (participant observer) in the method of participant observation enters directly into the activities of the group being studied.[6] The intent of the participant observer is to "catch the process as it occurs in the experience" of the group members. Becoming a normal part of the activities of the people under observation, the researcher acts in some degree as both participant and observer in all situations. The scientific role and the social role of the participant observer are

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6. Bruyn, Severyn T., THE HUMAN PERSPECTIVE IN SOCIOLOGY, Englewood Cliffs, N.J.: Prentice-Hall, Inc., 1966, pp. 13-22.

therefore interdependent.

Subjectivity refers to the observer's inner perspective. The result of adequate subjectivity is the sensitively accurate interpretation and explanation of the activities of the worker. Objectivity refers to the observer's outer perspective; it is that of the traditional scientific researcher. Adequate objectivity results in accurate measurement and prediction of human behavior in accepted or traditional "scientific" fashion.

Adequate subjectivity and adequate objectivity are required to lessen the problems of distortion in gathering data in the participant observation method. The same requirements hold true in the recommended methods of Technical Conference, Group Interview, and Individual Interview for answering the question: "What does a Marine really do?" In the paragraphs that follow, attention is directed to methods of assuring adequate subjectivity and adequate objectivity.

Subjectivity

Six major factors are central in determining the subjective adequacy of investigation: time, place, circumstance, language, rapport, and consensus.

Time. The likelihood of reaching an accurate determination of what activities go on in the group is a function of the length of time the researcher spends in the group. Several phases occur in the relationship of the participant observer with the group. These phases are: newcomer, provisional (on trial) member,

accepted member, personalized member (rapport established), imminent migrant (ready to leave the group). To go through these phases takes time. The more time that can be spent as an accepted member of the group, after good rapport has been established, the more useful and accurate data the researcher is likely to gather.

Place. The physical environment can have great impact on the relationship between observers and respondents. The closer observers work geographically to the people under study, the more accurate should be their interpretations. The idea "geographically close" implies more than mere physical closeness. It also implies the type of physical setting and the opportunities for actual observation of the subjects as they go about their daily lives.

Social Circumstance. The number and variety of social circumstances encountered within the group influence the accuracy of the researcher's interpretations. The researcher's social position or rank may shape the kind of data received from the respondents. Importance should be attached to observing subjects under contrasting social conditions. For example, group members may report different activities when alone with the interviewer than when in a group of their peers.

Language. The observer should be sensitive enough to recognize different word connotations, phrasings, and sentence struc-

tures in the group being observed. Accuracy of interpretation should increase as the observer becomes familiar with the language of the members. Since language links observer and observed, the observer may need to examine characteristics of the language being used--such matters as words most often repeated, most common slang expressions, special technical terms and abbreviations (or acronyms) that are peculiar to the OF or to an MOS within an OF.

Rapport. Rapport implies a friendly relationship between people. It is marked by mutual acceptance and respect, sincerity, a feeling of being at ease, and a willingness to be open and honest. The resulting harmony improves the quality of communication between interviewer and interviewee.

The observer can verify attainment of rapport by frequency of such occasions as being asked to join in group activities or to discuss matters usually kept within the group itself. The possibility of developing rapport increases with the observer's ability to show empathy with the members of the group, that is, to identify with the members and to try to see things as they see them.

The greater degree of rapport achieved with interviewees, the more accurate should be the interview observer's interpretations.

Consensus. Consensus implies some form of verbal assent or agreement that the meanings interpreted by the observer are cor-

rect. The observer may be able to confirm findings directly with members of the group. Findings must in any event be able to stand the test of having other researchers verify them.

Objectivity

Objectivity refers to a way of responding to phenomena and reporting responses so that other investigators can repeat the observations and verify the findings. Objectivity in this light is defined on the basis of social consensus--group members and researchers have reached essential agreement. If researchers have agreed upon the list of tasks in a job, for example, and several Marine respondents concur that the tasks are all there and are correctly stated, the group and the researchers may be considered to have reached essential agreement (consensus) and demonstrated objectivity.

Objectivity represents an outer perspective based upon observation. Observation in this sense is the common denominator of scientific inquiry.

From the foregoing discussion of the interaction between adequate subjectivity and adequate objectivity it may be seen that both are fundamental in the method of participant observation. No hard line may be drawn between subjective and objective data. The one merges into the other. As data gathered subjectively respond to verification by consensus within the group or by other researchers, they take on the qualities of objectivity--the so-called scientific method.

ASSUMPTION OF REALITY

Ruesch and Bateson state: "Scientific theory traditionally distinguishes between that which is assumed to exist in reality and that which is actually perceived by a human observer. The difference in the picture between assumed reality and perceived reality is explained as being due to the peculiarities and limitations of the human observer. In the study of human communication it is difficult if not impossible to distinguish between perceived and assumed reality. As psychiatrists and social scientists we are, by definition, interested to inquire into the ways an observer perceives the world rather than how this world really is, because the only method we possess to infer the existence of the real world is to compare one observer's views with the views of other observers. ... by combining the various observations to gain a picture of what one might call assumed reality."[7]

This assumption of reality is operationally useful for it makes possible statements of criteria of reliability and validity. Reliability implies that repeated measurements yield results that are identical or fall within a narrow limit of predictability. Validity implies that the measurements are meaningfully related to the research objectives--that is, that they measure what they purport to measure.[8]

Checking Reliabilities

One way to check the reliability of observations is to have two or more researchers make independent records and then compare them. If there is reasonable agreement, that is, the results agree within narrow and predictable limits of variability, reliability may be considered acceptable.

Another way to check reliability is to repeat the interviewing of the same group of respondents. If results fall within the

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7. Ruesch, Jurgen and Bateson, Gregory, COMMUNICATION: SOCIAL MATRIX OF PSYCHIATRY, New York: W.W. Norton & Co., Inc., 1968, p. 273.
8. Kerlinger, op. cit., (See Footnote, p. 14), ch. 24 and 25.

desired range, the reliability may be deemed satisfactory.

In the work previously reported (J.E. Morsh, 1964) the method of job analysis developed in the Air Force produced average reliabilities of 0.70. (The 0.70 is a coefficient of correlation and means that 49% of the two measures are in agreement.) Chris Argyris reports interobserver reliabilities of 0.88 (77%) to 0.94 (88%) in the recording of behavioral patterns among executives.[9] Here the observations were performed by skilled professionals. If the foregoing levels are taken as guides, an initial target of 0.70 to 0.80 average reliability seems reasonable for the task analysis efforts in the Marine Corps.

Validity

The question of validity, which can be both critical and complex, can be clearly stated in Task Analysis. Validity may be understood as the answer to this question: Are we measuring what we think we are measuring? The emphasis is on what is being measured. If experts in a particular Occupational Field check the Task Analysis task statements and discover no incorrect statements, or at best a very few, validity may be considered acceptable--the content is representative of the substance, or the topics, of the Task Analysis and truly reflects what is done in the OF.

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9. Argyris, Chris, ORGANIZATION AND INNOVATION, Homewood, Ill: Richard D. Irwin, Inc. and The Dorsey Press, 1965, p. 181.

RECOMMENDATIONS FOR ACHIEVING RELIABILITY AND VALIDITY

- Two members of a task team should gather data on tasks in an Occupational Field independently. Results should then be compared for interobserver reliability.
- Members of a task team working together may observations of tasks, preferably after a short time interval. Results can then be compared for reliability.
- Checking for validity should provide little problem since the task team will have become thoroughly familiar with the general requirements of tasks in a particular job in their intensive preliminary study of the Occupational Field. They should check for and attain a high level of agreement in their descriptions of these tasks.

IV

BUILDING SKILLS IN INTERVIEWING

Because interviewing is the most widely used tool in job analysis, all analysts need to learn how to make the most of each interview. Interviews are conversations aimed at uncovering information about a specific subject. Parties to the interview are interviewer and interviewee, or respondent. Each party may be an individual or a group. In any case, the interview is usually a direct method of eliciting data. Respondents will generally give much information directly, although some questions may have to be handled with care.[10]

The interview may be guided, semi-guided, or unguided. The guided interview may be made effective through the use of a schedule. The schedule is simply a carefully prepared list of questions or check-lists used to guide the interview. The study phase in TA should provide sufficient data for the preparation of schedules adequate for interviewing enlisted Marines, OF specialists, or experts in any other classification.

The characteristics of the TA process suggest the advisability of a semi-structured approach to interviewing. The schedule would help to uncover key tasks; through careful listening to clues emerging from answers to scheduled questions the conversation may be directed to exploration of areas not covered in the schedule.

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10. Kerlinger, op. cit., (See footnote, p. 14), ch. 26.

The Unguided Interview, which is characteristically used in non-directive counseling or for gathering data in sensitive behavioral situations, seems inappropriate for the purposes of TA.

Preparing for the Interview

The value of thorough preparation before gathering data by interviewing cannot be over-emphasized. As in achieving goals of any kind effectively, preparation includes three basic stages: setting objectives, organizing the approach, and planning the methods to be used.

Setting Objectives

Objectives as here discussed are confined to the O & I phase of TA. Objectives are usually defined as the specific overall accomplishments desired. Objectives must include considerations of quality, time, and manpower. The questions that should be answered in setting objectives for a TA project are: How do we define a satisfactory level of achievement in this particular TA assignment? How much calendar time will be required for the total task? How much money will need to be budgeted to perform the assignment? When objectives answering these questions satisfactorily have been set, attention should turn to organizing the approach.

Organizing the Approach

Organizing the approach consists in providing answers to the questions: Who? What? When? and Where? Answers to these

questions are combined through planning and scheduling, which should start with the preliminary study phase.

The preliminary study phase undergirds the success of O & I. The analysts should plan the gathering of data from the following and other related areas as the situation dictates: Information about positions and billets, programs and outlines of instruction, comparable military and civilian references, and pertinent training manuals of other military services.

Arrangements should be made to schedule interviews with military occupational field specialists, occupational field sponsors, monitors, and other HQMC agencies involved with the OF under study. Care should be taken to prepare the way for ensuring cooperation in these meetings.

Similar preparation should proceed the O & I phase itself. Careful planning and scheduling at the beginning of O & I will save time and effort during the program. Far more important, this effort will pay off in an efficient and productive procedure with acceptable reliability and validity.

Planning the Methods

The methods to be used for gathering data at each step of the way from preliminary study through the O & I phase should be agreed upon as part of the planning. Questions that should be answered in advance include the following: How should information be recorded during personal interviews? By pencil and paper note taking? By tape recorder for later transcription?

By refraining from taking notes during interviews, but recording the data from memory immediately after the interview?

How should data be analyzed and collated? What is the best way to organize the material so that schedules for subsequent interviewing may be readily prepared?

Suggestions for answering these questions are given in the following section.

RECOMMENDATIONS FOR PREPARING FOR OBSERVATION AND INTERVIEW

- The first stage of a Task Analysis program should be careful planning aimed at an efficient data gathering procedure.
- Planning should include setting objectives that specify the desired standards of performance: reliability, validity, and budgets of time and funds.
- Planning for O & I should include organizing by deciding who does what--which analysts are to perform what required tasks.
- The preliminary study phase should be included in the planning--and should be given as much forethought and care as the O & I phase that follows it.
- Methods for gathering data for all parts of the preliminary study and O & I should be incorporated in the planning.
- Gantt flow-chartering is recommended as a simple graphic way of showing the time allocations and relationships of

the plans. For more complex programs, planning by the methodology of Management By Objectives provides a powerful method. PERT also offers a systematic graphics way for managing more complex programs. Useful references:

Gantt and PERT charting: Harold Koontz and Robert M. Fulmer, A Practical Introduction to Business, Richard D. Irwin, Inc., Homewood, Ill., 1975, pp. 587-794.

Management by Objectives: Arthur H. Kuriloff, Organizational Development for Survival, American Management Association, New York, 1972, ch. 9, 10.

See also PERT manual, (Technical Report No. 3).

WHAT MAKES FOR A GOOD INTERVIEW?

Three basic principles provide the key to good interviews:[11] 1) The initiative in the interview lies with the interviewer. The interviewer, as in any research involving people, should hold the lead position without overpowering the respondent. In no case should the relationship induce defensiveness in the respondent. Defensiveness defeats achievement of the openness and rapport needed to get full and accurate information. 2) The interviewer's attitude and manner should show sincere interest in the respondent. This is basic in establishing rapport and developing an open, productive atmosphere for the conduct of

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11. Black, James Menzies, HOW TO GET RESULTS FROM INTERVIEWING, New York: McGraw-Hill Book Co., 1970, pp. 14-15.

the interview. 3) The interviewer must never forget to guide and direct the interview, but without being overbearing.

DEVELOPING INTERVIEWING SKILL

Skill in interviewing comes from asking the right questions at the right time in the right words. But asking the right question is not enough; the researcher must develop the ability to listen actively to the responses. Listening actively means hearing and understanding what is being said--and being able to recall the important points. (See Report for Research Area 6.)

Characteristics of the Right Question

The right question, to be used in schedules for structured or semi-structured interviews, may be checked for appropriateness against the following criteria:[12]

- The question should relate directly to the purpose of Task Analysis.
- The wording should be clear and unambiguous.
- The question should not "lead" the respondent; that is, the wording should not imply that a specific answer is desired.
- The question should not be "loaded" with the implication that one form of response might be more socially desirable than another.
- The question should not ask for knowledge or information

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12. Kerlinger, op. cit., (See footnote, p. 14), pp. 473-475.

the interviewee doesn't have.

- There should be no personal or intimate material that the respondent might resent.

RECOMMENDATIONS FOR CHECKING QUESTIONS

- Use the simplest available words in formulating questions. Reference to the report under Research Area 2, Task Inventory Construction, gives guidelines for the use of concrete, simple words.
- Develop the ability to listen actively. Suggestions for training in this skill will be found in Technical Report No. 8, Communications In Task Analysis, Training Manual IV, Chapter 2, pp. 18-26.
- Check questions developed for schedules against the criteria given in the foregoing section. Questions posed in any unstructured portion of the interview should also conform to these criteria.

Building Respondent Motivation

If the respondent can be motivated to answer questions and to provide information openly and freely, the data gathering procedure can be extremely effective. The respondent cannot help but accept the authority of the interviewer because of the official character of the situation and the status differential between interviewer and interviewee. The interviewer should do everything possible to reduce the status barrier for the sake of

open communication.

One step to ease the relationship would be for the analysts to wear civilian clothing when engaged in O & I.

Entrance into the O & I procedure would be aided by advance notice or letters explaining the intent of the TA and what is expected. The announcement might show how the Marine's individual career development could be helped as a result of O & I since one of the objectives of TA is to construct a workable grade and MOS structure that will provide for an orderly upward movement in rank.[13] Effort should be made to relate the interview to personal goals the respondent is thought to value.

The interview itself should start with questions designed to develop the respondent's active interest and enthusiasm. These questions might be aimed at the respondent's expectations and aspirations. Once these are known, the interviewer could then show how the interviewee's answers to the TA questions would help to ensure proper placement and training for advancement. The question and answer session could then be directed smoothly into the main body of the schedule.

RECOMMENDATIONS FOR BUILDING RESPONDENT MOTIVATION

- Advance notice of interview sessions should explain carefully in simple language the intent of TA and the benefits it can bring to the individual Marine respondent.
- Interviews should open with "ice-breakers", questions

13. Capts. Cummins, C.J. and Shahan, M.J., op. cit., p. 31.

to develop the respondent's active interest and a cooperative attitude.

- The analyst should grasp every opportunity to establish and maintain rapport with the respondent.

IMPROVING LISTENING ABILITY

Listening intelligently is basic to successful interviewing.[14] The opportunity to listen intelligently can come only when the respondent talks. Questions should therefore be couched so as to encourage the respondent to do most of the talking.

Although the interviewer may listen intently, there will be occasions when answers to questions will not be clear and responsive. Lack of clarity may stem from the respondent's lack of understanding of the question or use of colloquialism or slang not known to the analyst. The analyst should then test the meaning by feedback, for example, by saying, "If I understand you, you're saying thus and so?" The language chosen would be the simplest possible. The analyst would pursue the point quietly until sure that the meaning is clear.

USING THE TIME GAP

Concentration during listening is more difficult than during most other human activities. The problem originates in our ability to think much faster than we can talk. The average rate of speech for most Americans is 125 words per minute. We can

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14. Black, op. cit., pp. 35-39.

think about six or seven times as fast as we can talk.[15] When we listen, therefore, we continue thinking at a high speed while the words we are listening to arrive at a low speed. In other words, we can listen and still have considerable spare time for thinking. How well we use this spare thinking time holds the answer to whether we listen effectively or poorly.

There are four mental activities that good listeners engage in while listening.[16] These activities are well coordinated: they direct a maximum amount of thought to the message being received. Little time is left for day-dreaming or side excursions leading away from the speaker's thought. The four helpful activities are:

The listener thinks ahead of the speaker, trying to anticipate what the discourse is leading to and what conclusions will be drawn from the words spoken at the moment.

The listener weighs the evidence used by the speaker to support the points being made, asking mentally, "Is this point valid? Is the evidence complete?"

Periodically the listener reviews and mentally summarizes the points presented so far.

Throughout the conversation, the listener "listens between the lines" for meaning not necessarily spoken.

The listener pays close attention to nonverbal signals, facial expressions, gestures, tone of voice, and emphasis

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15. Brown, Ray E., JUDGMENT IN ADMINISTRATION, McGraw-Hill Book Co., 1966, p. 136.
16. Nichols, Ralph G. and Stevens, Leonard A., "Listening to People", HARVARD BUSINESS REVIEW, Sept./Oct., 1957.

to see if meaning has been altered in some way.

The time gap created by the difference in speeds of talk and listening permits plenty of time to accomplish these four mental tasks. However, they do require practice before the habit of listening effectively can be acquired.

RECOMMENDATIONS FOR USING THE TIME GAP TO IMPROVE LISTENING

- Develop skill for intelligent anticipation.
- Practice keeping slightly ahead of the speaker.
- Learn to think at two levels: listen to what is being said while analytically judging the ideas being expressed.
- Learn to summarize: outline and summarize mentally as the interview proceeds.
- Check yourself as an active listener; are you
  - A conversation capper?
  - An agile anticipator?
  - A listless listener?
  - A prosecuting attorney?
  - A simultaneous question-snapper?
  - A faulty question framer?

RECOMMENDATIONS FOR MANAGING THE INTERVIEW

Assuming that the analysts have done a thorough job of preparing for the interview through setting objectives, organizing the approach, and planning the methods, they are in sound position

to manage the interview effectively. Following are some recommendations for managing the interview:

- Select proper accomodations that ensure privacy for the interview.
- Avoid status symbols such as insignia of rank or a platform or desk between analyst and interviewee.
- Relate the interview to goals the interviewee holds important.
- Build the interviewee's interest in advance through well prepared announcements.
- Give the background, "why the interview".
- Show honest personal interest in the interviewee.
- Do not be aloof, condescending, or authoritative.
- Ask questions to encourage the respondent to talk.
- In unscheduled portions of the interview use probing techniques to keep the conversation alive: an expectant pause, brief assenting comments, unobtrusive neutral questions, summarizing what the respondent just said, or repeating the question.
- Keep a steady consistent pace.
- Indicate the approach of the end of the interview by the kinds of questions you ask and by the inflection of your voice.
- Conclude by pointing out the use and value of the information the respondent has given.

Checking the Data

The best time to check the data gathered is immediately after the interview. Look for omissions in the data. Rectify any omissions as soon as possible.

V

IMPROVING OBSERVATION

A significant problem with observation is the observer. The answer given to a question may be conditioned by the personality and other characteristics of the individual asking the question. Not only may the interviewer have an effect on the response but there may also be an effect due to the manner in which the question is phrased.[17] Ensuring acceptable reliability may be enhanced for both visual and aural observation in the original planning of objectives and methods. This may be done by giving careful consideration to four basic questions:[18]

- What should be observed?
- How should observations be recorded?
- What procedures should be performed to assure accuracy of observation?
- What relationship should be maintained between observer and observed?

WHAT SHOULD BE OBSERVED?

The intent of observation in TA is to gather data as the basis for answering the following questions:

- What does the Marine really do?
- Why does he perform his job?
- How does he perform his job?

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17. McCarthy, Philip J., INTRODUCTION TO STATISTICAL REASONING, New York: McGraw-Hill Book Co., 1957, p. 11.
18. Margulies, Newton and Raia, Anthony P., ORGANIZATIONAL DEVELOPMENT: VALUES, PROCESS, AND TECHNOLOGY, New York: McGraw-Hill Book Co., 1972, pp. 191-202.

- What skill attributes and levels does he require to perform his job?[19]

In the observation and interview phase performed to date, the analysts have visited selected Marine Corps commands to interview and observe Marine job incumbents as they actually performed their work. What should be observed in this situation would follow the pattern outlined in Marine Corps Order 1200.13A: "... a selected representative sample of Marines, by grade, MOS, and job will be chosen for personal interview and observation by a team of analysts from this Headquarters. This interview and observation will take place at the job incumbent's worksite."[19]

When pay grades in each billet and MOS are interviewed and observed, the task analyst concentrates primarily on gathering data at the task level. The hierarchy of the job in a MOS shows where the task fits (See Figure 1, page 4):

JOB - A billet or position for which a Marine is selected, classified, trained, and assigned.

DUTY - Recognized as being the Marine's principal set of responsibilities and involves work that uses related skills, knowledge, and abilities.

TASK - One of the work operations that constitutes a logical and necessary step in the performance of a duty and is performed to some standard. It occupies a significant portion of work time spent in the performance of a duty and occurs once or more in the work cycle of a duty. (THIS IS THE LEVEL UPON

19. Marine Corps Order 1200.13A, 27 Nov. 1972.

WHICH THE TASK ANALYST FOCUSES.)

ELEMENT - This is the smallest step into which it is practicable to subdivide any work operation without analyzing separate motions, movements, and mental processes.[20]

Analysts have on occasion experienced some difficulty in distinguishing between tasks and elements of tasks. As a matter of good practice, observation should be as inclusive as possible. Elements can then be separated from tasks at an analysts' meeting after the observation-interview sessions. Unfortunately no hard and fast rule for separating elements from tasks appears available. Judgmental evaluation by consensus seems to be the most practicable solution. The level of the job, and its related duties will set the level of tasks and dependent elements. For example, the job of automotive mechanic might have as one of its duties tuning engines. A task in tuning an engine requires adjusting the carburetor. Elements in adjusting a carburetor include adjusting the gasoline-air mixture, adjusting the idle speed, and changing the filter. A job of a legal officer might be that of defending military prisoners. A task under this job would be preparing a brief for the defense. An element of this task would be researching cases to find precedents for use in the brief.

HOW SHOULD OBSERVATIONS BE RECORDED?

The best time for recording is undoubtedly on the spot during

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20. Capts. Cummins, C.J. and Shahan, M.J., USMC, op. cit., p. 32.

the procedure being observed. This avoids problems of omission or inaccurate recollection when memory alone is relied upon. Taking notes, if done with reasonable care, can produce an accurate record of the data. Note-taking should not be so obtrusive as to distract the interviewee's attention or inhibit the interviewee's behavior. Constant note-taking should be avoided as it may interfere with the quality of the observation.

A simple mnemonic system can help the analyst to recall specific points, if note-taking is not indicated. For example, it is possible to associate key events with letters of the alphabet. The first significant observation would be associated with the letter A, the second with B, and so on. Immediately after the session, the analyst would write down the key words attached to each letter. A summary of the data would then be developed from the key words.

When limited note-taking appears the most feasible method, the analyst can jot down the key words themselves during the observation period--this is easier and more dependable than the mnemonic method.

Other Recording Methods

Many uncomplicated small cassette tape recorders are now available. These offer an excellent way to record data on the spot. One advantage of taping the data is that the tape may be reviewed at the analyst's convenience. Specific portions that

are unclear may be repeated as desired until clarity is agreed upon. Nuances of meaning may also be detected from the respondent's inflection and emphasis, where this might be missed or forgotten when notes are used for recording information.

The ultimate in recording would, of course, by by portable tape-TV. This would require relatively expensive equipment, but it would have additional advantages over sound recording alone. The pictures would show work in process and would add the visual dimension of expression and gesture to the interpretation of inflection and emphasis in the interviewee's responses.

Whatever the method of recording, the respondent should be advised and asked for consent at the beginning of the observation period.

TRAINING IN OBSERVATION

One recommended way of training in observation would be through the use of a carefully prepared film or TV tape. The film would show a group of tasks or several groups of tasks being performed in a duty or duties. Trainees would be asked to prepare notes on the tasks they observe in the film. These would then be checked against a list of tasks compiled by experts in the fields presented. Successive practice sessions with increasingly complex tasks should improve skill in observation. This method of training with film is being used successfully in the training of Safety and Health Inspectors.

The method could also be used to develop and test for inter-observer reliability.

The training should begin with an explanation of its purposes to the trainee. This should be followed by an explanation of the procedure. The length of training should be set by the time required for the trainee to obtain adequate agreement with the check list of data prepared by the experts. Adequate agreement, as a recommendation, should be set at 85 to 90 percent.

TRAINING IN INTERVIEWING

Training is usually best performed, most interesting for the trainees, and most effective when it involves the participants in material that represents actuality.

Training in interviewing could be performed effectively within Task Analysis teams. Each member as a specialist in a particular field could act as an "interviewee" in practice sessions. A suggested format for training sessions would be for the novice member to interview the "interviewee" in the presence of the rest of the team. The team members would observe, provide feedback to the trainee, and offer suggestions for improvement. All would gain by these experiences. The new trainees would learn and the team members would be alerted to effect improvement in their own techniques.

An excellent way to get feedback on performance in interviewing is through tape recording or preferably TV tape recording. In the TV tape method the trainee's impact on the interviewee is visible to all in the training group. Direct communication and metacommunication (gesture, expression, and emphasis)

are observable. A complete spectrum of feedback signals allows the interviewer to see and correct ineffective behavior. The Training group simultaneously learns by example.

VI

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This entire issue is devoted to discussions of communications problems and programs in business organizations. Authors include corporate managers and academicians. Subjects include oral communications, including listening, communications styles and credibility, information and misinformation, over-communication, and evaluating communications.

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